

WHAT IS CLAIMED IS:

1. A diesel fuel cetane improver, the cetane improver comprising:
beta-carotene; and
2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline.
2. A diesel fuel cetane improver, the cetane improver comprising:
a cetane improving additive selected from the group consisting of carotenes, carotenoids, carotene derivatives, carotene precursors, carotenoid derivative, carotenoid precursors, long chain olefinic compounds, and mixtures thereof; and
a stabilizing compound that inhibits oxidation of the cetane improving additive.
3. The diesel fuel cetane improver of claim 2, wherein the stabilizing compound comprises 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline.
4. The diesel fuel cetane improver of claim 2, further comprising a plant oil extract and a thermal stabilizer.
5. The diesel fuel cetane improver of claim 4, wherein the plant oil extract comprises an oil extract of a plant of the *Leguminosae* family.
6. The diesel fuel cetane improver of claim 4, wherein the plant oil extract comprises oil extract of barley.
7. The diesel fuel cetane improver of claim 4, wherein the plant oil extract comprises chlorophyll.
8. The diesel fuel cetane improver of claim 4, wherein the thermal stabilizer comprises jojoba oil.
9. The diesel fuel cetane improver of claim 4, wherein the thermal stabilizer comprises an ester of a C20-C22 straight chain monounsaturated carboxylic acid.
10. The diesel fuel cetane improver of claim 4, wherein the plant oil extract comprises oil extract of barley and the thermal stabilizer comprises jojoba oil.
11. The diesel fuel cetane improver of claim 2, further comprising a diluent.
12. The diesel fuel cetane improver of claim 11, wherein the diluent is selected from the group consisting of toluene, gasoline, diesel fuel, jet fuel, and mixtures thereof.
13. The diesel fuel cetane improver of claim 2, further comprising an oxygenate.
14. The diesel fuel cetane improver of claim 13, wherein the oxygenate is selected from the group consisting of methanol, ethanol, methyl tertiary butyl ether, ethyl tertiary butyl ether, and tertiary amyl methyl ether, and mixtures thereof.
15. The diesel fuel cetane improver of claim 2, further comprising at least one additional additive selected from the group consisting of octane improvers, cetane improvers, detergents, demulsifiers, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives,

antiwear additives, antioxidants, thermal stabilizers, plant oil extracts, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, and mixtures thereof.

16. The diesel fuel cetane improver of claim 1, wherein a ratio of grams of beta-carotene to grams of 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline in the additive is from about 20:1 to about 1:1.

17. The diesel fuel cetane improver of claim 1, wherein a ratio of grams of beta-carotene to grams of 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline in the additive is from about 15:1 to about 5:1.

18. The diesel fuel cetane improver of claim 1, wherein a ratio of grams of beta-carotene to grams of 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline in the additive is about 10:1.

19. The diesel fuel cetane improver of claim 2, further comprising 2-ethylhexyl nitrate.

20. An additized diesel fuel, the diesel fuel comprising a base fuel and a fuel additive for use in improving cetane number, the fuel additive comprising:

beta-carotene; and

2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline.

21. An additized diesel fuel, the diesel fuel comprising a base diesel fuel and a fuel additive for use in improving cetane number, the fuel additive comprising:

a cetane improving additive selected from the group consisting of carotenes, carotenoids, carotene derivatives, carotene precursors, carotenoid derivative, carotenoid precursors, long chain olefinic compounds, and mixtures thereof; and

a stabilizing compound that inhibits oxidation of the cetane improving additive.

22. The additized diesel fuel of claim 20, wherein the fuel comprises from about 0.00025 g to about 0.05 g beta-carotene per 3785 ml additized diesel fuel and from about 0.000025 g to about 0.005 g ethoxyquin per 3785 ml additized diesel fuel.

23. The additized diesel fuel of claim 20, wherein the fuel comprises from about 0.00053 g to about 0.021 g beta-carotene per 3785 ml additized diesel fuel and from about 0.000053 g to about 0.0021 g ethoxyquin per 3785 ml additized diesel fuel.

24. A method for producing an additized diesel fuel, the method comprising the steps of:

preparing a first additive by combining beta-carotene, ethoxyquin, jojoba oil, and a diluent, the first additive comprising about 4 ml jojoba oil, about 4 g beta-carotene, and about 0.4 g ethoxyquin per 3785 ml of the first additive;

preparing a second additive by combining an oil extract of barley, jojoba oil, and a diluent, the second additive comprising about 4 ml jojoba oil and about 19.36 g oil extract of barley per 3785 ml of the second additive; and

adding the first additive and the second additive to a base diesel fuel to produce an additized diesel fuel, such that the additized diesel fuel comprises from about 0.15 ml to about 20 ml of the first additive per 3785 ml of additized diesel fuel and from about 0.3 ml to about 3.6 ml of the second additive per 3785 ml of additized diesel fuel.

25. A method for producing an additized diesel fuel, the method comprising the steps of:

preparing a first additive by combining beta-carotene, ethoxyquin, jojoba oil, and a diluent, the first additive comprising about 32 ml jojoba oil, about 3.2 g ethoxyquin, about 32 g beta-carotene per 3785 ml of the first additive;

preparing a second additive by combining an oil extract of barley, jojoba oil, and a diluent, the second additive comprising about 32 ml jojoba oil and about 155 g oil extract of barley per 3785 ml of the second additive; and

adding the first additive and the second additive to a base diesel fuel to produce an additized diesel fuel, such that the additized diesel fuel comprises from about 0.0625 ml to about 0.625 ml of the first additive per 3785 ml of additized diesel fuel and from about 0.3 ml to about 0.45 ml of the second additive per 3785 ml of additized diesel fuel.

26. A gum inhibitor for gasoline, the gum inhibitor comprising:

2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline.

27. A gasoline composition comprising 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline.

28. The gasoline composition of claim 27, wherein the 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline is present in the gasoline composition at a concentration of about 50 to 1000 ppm.

29. The gasoline composition of claim 27, wherein the 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline is present in the gasoline composition at a concentration of about 100 to 500 ppm.

30. The gasoline composition of claim 27, wherein the 2,2,4-trimethyl-6-ethoxy-1,2-dihydroquinoline is present in the gasoline composition at a concentration of about 200 to 400 ppm.